UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/801,630	03/15/2004	Chien Hung Ming	JCLA12418	2948

23900 7590 11/16/2006

J C PATENTS, INC.
4 VENTURE, SUITE 250
IRVINE, CA 92618

EXAMINER	
ELAND, SHAWN	

ART UNIT	PAPER NUMBER
2188	

DATE MAILED: 11/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/801,630	MING, CHIEN HUNG	
	Examiner	Art Unit	
	Shawn Eland	2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 March 2004 & 28 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 2 fails to further limit claim 1. Both claims state that the blank blocks are continuous (see claim 1, lines 4 – 5 and claim 2, lines 1 – 2).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> **The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.**

Claims 9 – 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 10 & 12 contain the element "the RAID, further comprising" (see line 1 for both claims). There is insufficient antecedent basis for this limitation in the claims. For the purposes of this Office action, the Examiner will interpret claim 10 as being dependent upon claim 9 and claim 12 as being dependent upon claim 11.

Claims 9 & 11 contain the element "wherein m" (see the last line of part (a) in both claims). This element doesn't make sense in the claim and it appears that it is incomplete. For the purposes of applying art in this Office action, the Examiner will simply assume this to mean that m >= 1.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 – 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Arnott (US 2003/0088803).

In regards to claim 1, Arnott teaches a redundant array of independent disks (RAID) (see element 101 in figure 1), comprising N number of storage devices (see elements 110 – 113), wherein: each of the storage devices comprises M number of stripes of storage blocks (see PB0 – PB17 in figure 2) comprise at least P number of stripes of data blocks (see PB0 – PB11 in figure 2) and Q number of continuous stripes of blank blocks (see PB12 – PB17), the data blocks are suitable for storing data (see elements 102 – 105 in figure 1), the blank blocks are reserved blocks (see elements 106 – 109 in figure 1), and M, P, and Q are positive integers, wherein: $S_{I,J}$ is the J^{th} stripe of storage block in the I^{th} storage device; $B_{I,J}$ is the J^{th} stripe of storage block in the I^{th} storage device, and which is a blank block; wherein, I is a positive integer of 1 ~ N, J is a positive integer of 1 ~ M, and when $S_{I,J} = B_{I,J}$, $S_{I+1,J} = B_{I+1,J}$ (see FB1-0 – FB4-0,

FB1-1 – FB4-1, FB1-2 – FB4-2, FB1-3 – FB4-3, FB1-4 – FB4-4, & FB1-5 – FB4-5 in figure 2).

For claim 2, Arnott teaches wherein the stripes of the blank blocks are distributed as continuous stripes (see PB12 – PB17 in figure 2).

For claim 3, Arnott teaches wherein the stripes of the blank blocks are distributed as a plurality of continuous stripes (see PB12 – PB17 in figure 2).

For claim 4, Arnott teaches wherein a total size of the blank blocks in each storage device is equal to a size of a maximum block provided by each of the storage devices (see [0032]). (If there are 4 disk drives (D) and 3 data blocks (N), then there would only be 1 free block (F) per storage device. Then the total free blocks per device are equal to the maximum size block because all blocks in this invention are the same size.)

For claim 5, Arnott teaches wherein a total size of the blank blocks in each storage device is greater than a size of a maximum block provided by each of the storage devices (see [0025]).

For claim 6, Arnott teaches wherein each of the storage devices is a single physical disk (see elements 110 – 113 in figure 1).

For claim 7, Arnott teaches wherein each of the storage devices is a logical disk formed by a plurality of physical disks (see [0060]; using a RAID10, or another nested RAID array, would create a group of physical disks that were seen as one logical disk per storage device).

For claim 8, Arnott teaches wherein each of the storage devices is composed of a partial segment of a physical disk (see [0069]; the first equation clearly states that the total number of data (N) and free (F) blocks can be less than the number of physical blocks (B) on each physical disk and, thus, only use a portion of each physical disk).

Claims 9 – 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Franklin (US 2002/0152415).

In regards to claim 9, Franklin teaches (a) providing a plurality of storage devices (see elements 106 – 109 in figure 1), wherein each of the storage devices comprises a plurality of stripes of data blocks and at least a stripe of blank blocks (see elements 103 – 105), and a size of each blank block is m times that of each data block (see elements 205 & 301 in figure 3; both blocks are the same size so m=1), wherein m (b) partially reading continuous data blocks on a conjunction point of the blank blocks (see [0039]; see elements 205 & 301 in figure 3 – the start region to be moved is always the region alongside the empty region), wherein the continuous data blocks are sequentially read (see [0042]); and (c) writing the read data blocks into one of the blank blocks and then forming a new data block in the position of the one of the blank blocks (see [0038]), wherein the size of the new data block is m times that of each original data block (see elements 205 & 301 in figure 3; both blocks are the same size so m=1).

For claim 10, Franklin teaches (d) repeating steps (b) and (c) until the blank blocks are all filled, wherein a new stripe of data blocks is formed in the original position of the stripe of blank blocks, and a new stripe of blank blocks is formed in the original

position of the read data blocks simultaneously (see element 403 in figure 4; see also figure 1).

In regards to claim 11, Franklin teaches (a) providing a plurality of storage devices (see elements 106 – 109 in figure 1), wherein each of the storage device comprises a plurality of stripes of first data blocks and at least a stripe of blank blocks (see elements 103 – 105), and; a size of each blank block is m times that of each first data block (see elements 205 & 301 in figure 3 – both blocks are the same size so m=1), wherein m (b) sequentially reading one of the first data blocks on a conjunction point of the blank blocks and the first data blocks (see [0042]); (c) splitting the read first data block into a plurality of second data blocks (see [0042] & [0025]; migrating from a 5 to a 50 RAID level system, where the block size of the 50 was ½ the block size of the 5, would do just this); and (d) writing the second data blocks into the corresponding blank blocks, respectively (see [0038]).

For claim 12, Franklin teaches (d) repeating steps (b), (c) and (d) until the blank blocks are all filled, wherein multiple stripes of second data blocks is formed in the original position of the stripe of blank blocks, and a new stripe of blank blocks is formed in the original position of the read first data blocks simultaneously (see element 403 in figure 4; see also figure 1). (Continuing the previously mentioned case of migrating from a RAID level 5 to a RAID level 50 in claim 11, the disks in elements 106 – 109 from figure 1, while appearing as a single disk at the upper level, would in reality be stripes of 2 or more disks whose block size is ½ that of the upper "disks" 106 – 109. So element 302 in figure 4 wouldn't actually be a single block, but multiple blocks.)

Examiner Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shawn Eland whose telephone number is (571) 270-1029. The examiner can normally be reached on Monday - Thursday from 7:30am to 5:00pm. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung Sough, can be reached on (571) 272-4199. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SE

Shawn Eland
11/09/2006

HYUNG SOUGH
SUPERVISORY PATENT EXAMINER
11/13/06